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Mollusca and other shell fragments from the General Accident Extension site, York (1983-4.32)

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T.P. O'Connor
Environmental Archaeology Unit
University of York

Contents

1. Introduction

1.1 The site

The General Accident Extension site (also known as 24-30 Tanner Row) was located at the junction of Rougier Street and Tanner Row, near the South-West bank of the River Ouse in the centre of York. The purpose of the excavation was to investigate Roman and later structures in an area known to have been the civilian <u>colonia</u>, immediately across the river from the legionary fortress established late in the 1st century A.D.

Excavation in five linked trenches (hereafter Areas 1 to 5) revealed a deep sequence, beginning with what appeared to be natural water-courses of pre-Roman date draining into the river. The first substantial structure was an extensive cobbled surface, which was succeeded by a thick bank of organic debris and a sequence of timber buildings, these apparently of late 2nd century date. The timber buildings were overlain by the construction trenches for a substantial stone structure, which was subsequently robbed for building material. The date of this robbing is unclear: at earliest it was late Roman, at the latest 11th century. In the medieval period, the area was given over to pit-digging and rubbish disposal.

In the tables in section 4 of this report, phasing is given as follows:
A - pre-Roman: mainly watercourse fills and surface deposits
B - Roman: largely 2nd-early 3rd century
D - 'Robbing phase': post-Roman, but date uncertain
E - medieval pits and accumulations
F - post-medieval and recent deposits

1.2 Materials and methods

This report describes and discusses all categories of 'shell' obtained from the General Accident site. The majority of this shell was derived from molluscs, but eggshell and crustacean carapace are also included. Shell was recovered by two means. Some material was collected by hand during excavation, in the same way as the larger pieces of bone or pottery. This assemblage is obviously biased towards the larger-shelled taxa. Only large marine molluscs - nearly all oyster - were represented amongst the hand-collected shells. Smaller shells and shell fragments were recovered by wet-sieving large soil samples (typically 15-30kg). These samples were wet-sieved on a 1mm aperture nylon mesh. The residue was dried, then dry-sieved through a 2mm mesh. The 2mm+ fraction was sorted for biological and cultural finds of all types.

Specimens were identified to as low a taxonomic level as possible using published keys and by comparison with reference specimens held in the collections of the Department of Biology, University of York. Numbers of gastropod apices and pelecypod valves were counted, and comminuted shell was roughly quantified on a three-point scale of abundance as F (= few fragments: 1-10), S (= some: about 10-50) or M (= many: 50+ fragments). The data were loaded onto the University of York DEC-10 computer, and were sorted and investigated by means of the 1022 database management system.

It should be noted that this report is based on such material as was available for study at 15th January 1986, so as to meet project deadlines. In the fullness of time, the phasing and dating of the site will be revised and refined, and it is possible that limited further investigation of soil samples from the site will produce additional small numbers of molluscs. Accordingly, the results presented in this report should be taken as preliminary, and should not be quoted without prior consultation with the author.

1.3 The archive

All finds and records pertaining to this site will be stored at the Yorkshire Museum, York, under accession code 1983-4.32. A complete catalogue of all shell records is held at the Environmental Archaeology Unit, University of York.

1.4 Acknowledgements

Excavation of the site was funded in part by the site owners, General Accident Insurance, and in part by the Historic Buildings and Monuments Commission for England. Study of the shells was funded through the Ancient Monuments Laboratory of the HBMC for E. Sample residues were all sorted by staff funded by the Manpower Services Commission and by unpaid volunteers.

2. Results

2.1 Marine species collected by hand

A total of 488 records of hand-collected shells were made from 411 contexts. Of these, 451 (92.4%) were of oyster, totalling 5462 valves (2815 left, 2647 right). The frequency of occurrence of seven marine taxa is given in Table 4.1. The predominance of oysters is marked, to say the least, and none of the other taxa are at all surprising, all being common and edible. Perhaps the sheer abundance of oysters is itself worthy of remark. Other edible molluscs were evidently available at all periods and exploited in small numbers, so perhaps the concentration on oysters had as much to do with cultural factors or tastes as with any environmental determinant. The size-bias of hand-collection will have militated against the recovery of cockles and mussels to some extent, but can hardly be held to account for the paucity of whelks.

2.2 Size distribution of oyster shells

To have measured all complete oyster shells would have been unjustifiably profligate of resources, so 19 samples of left valves were measured in order to examine any differences in size range between Roman (basically 2nd to early 3rd century) and medieval (12th-13th century) deposits. In all, 523 left valves were measured. Because many specimens were slightly abraded along the pallial margin, and because of uncertainty with asymmetrical specimens as to the exact line to measure from umbo to pallial margin, valves were only measured to the nearest 5mm. In effect, the sample was grouped into 5mm size classes. This procedure proved to be quick and acceptably accurate. More precise measurement would have limited the samples to only the most perfectly preserved specimens, and it is doubtful that any additional information would have been gained.

In Table 4.2, the shells in each of the 19 samples are distributed by size class, with totals given for chronological periods. The results show oysters in Roman levels to have been generally larger than those in medieval deposits, with a greater size range in Roman levels. Although exact calculation of arithmetic mean for this approximately measured dataset is to some extent inappropriate, means show a steady decrease from 78mm in pre-Roman levels to 72mm in Roman deposits to 60mm in medieval levels. Despite the approximations involved, it seems clear that the oysters being exploited by people fishing out of York decreased in average size from the beginning of the Roman settlement to the medieval period. The most plausible corollary of this would be to see the size change as reflecting a reduction in the average age of the oysters available for collection. The medieval deposits yielded oysters of a fairly narrow size range, and it is tempting to see this as representing quite intensive exploitation of oyster beds, with collection concentrating on specimens of a desired age and size allowing few individuals to reach their potential maximum size. In Roman deposits there were small numbers of large oysters (the biggest over 120mm in length), and a higher mean, which on this interpretation would suggest less intensive exploitation of oyster populations in the Roman period.

2.3 Distribution of shell in soil samples

Table 4.3 gives the numbers of records of shell taxa recovered from soil samples. The greater diversity of taxa represented in Roman than in medieval levels is probably in part a function of burial conditions and preservation, although one real difference can be picked out. Crab shell was quite frequent in Roman samples, though scarce in other deposits, and it seems unlikely that this fairly robust material would not have been preserved in medieval pits given that mussel and egg shell were commonly recovered from medieval samples. It would appear, therefore, that regular exploitation of edible crab was peculiar to the Roman period.

Some spatial discontinuity is evident in the distribution of crab, mussel, egg and oyster shell in Roman deposits within Areas 1 to 4 of the excavation (Table 4.4). Mussel shell fragments were more frequent in Area 1, whilst eggshell was more frequent in Area 2. It should be stressed that these are relative frequencies, taking the frequency of oyster as a standard, not absolute frequencies measured against volume of sediment or man-years of occupation. Crab shell was evenly distributed in Areas 1 and 2, and Areas 3 and 4 yielded insufficient records in total to permit any comparison. The records of hand-collected shell, too, show mussels in Roman deposits to have been concentrated in Area 1.

2.4 Land and freshwater molluscs

Samples from Roman deposits yielded small numbers of land and freshwater molluscs. The freshwater molluscs were presumably derived from the nearby River Ouse. The land snails probably indicate conditions on and around the site, although it is possible that small numbers of shells were brought into the city with loads of various raw materials, such as hay or timber.

Three taxonomic points should be noted. Shells of limacid slugs were compared with descriptions given by Quick (1960), Ellis (1926), and Adam (1960), and with reference specimens, and some identifications were possible. The single specimen from Roman levels was identified as *Deroceras caruanae*, with other specimens identified as this species and as *D. reticulatum*. The identification of *D. caruanae* in Roman deposits (context 3113) is of interest as this is a species with a fairly westerly distribution in Britain today, which appears to be extending its distribution eastwards in association with man, and may be of recent re-introduction to Britain (Kerney and Cameron, 1979, 143: South, 260-1: but note Hayward, 1954). A slug of gardens and waste ground, *D. caruanae* is notable mainly for being irritable and aggressive.

It should also be noted that the entry for *Trichia hispida* in Table 4.3 is for a group identification. Several specimens showed the features of *T. plebeia* (Drap.), but in view of the great difficulty of separating the two species on shell characters, and the notorious variability of *T. hispida*, all small *Trichia* specimens have been listed as *T. hispida*, which some undoubtedly were. All *Cepea* specimens have been assigned to *Cepea* sp. Those specimens which could be identified to species level were all *Cepea hortensis*, but uncertainty remains over juveniles and broken specimens, hence the cautious attribution.

Of the freshwater taxa in Roman and pre-Roman levels, four show a marked preference for hard water (*Planorbarius corneus*, *Planorbis planorbis*, *Theodoxus fluviatilis*, *Bithynia tentaculata*), and their presence in these samples would suggest the Ouse to have been carrying dissolved calcium at 20mg/litre or more. *Anisus leucostoma*, *Lymnaea glabra*, *L. palustris* and *L. truncatula* are often associated with small, sometimes temporary, pools and ditches, although *A. leucostoma* is equally capable of living in clean flowing rivers (Boycott, 1936, 129-30). *Aplexa hypnorum* is common today on intermittently flooded ground, such as *Glyceria* swamps. The commonest land snails from these levels would be consistent with riverside vegetation (*Cepea* sp., *Succinea putris*) or the decaying detritus of the human settlement (*Discus rotundatus*, *Helix aspersa*, *Trichia hispida*, *Nesovitrea hammonis*). The only oddity is a single specimen of *Candidula gigaxii*. Although this species is found in the York area today, it is much more common in the South-East of England (Kerney 1976, map 147), where it is associated with dry chalk grassland. It seems most likely that this solitary specimen was imported accidentally, perhaps with some raw material brought in from the Wolds. It should be noted that the examination of plant macrofossils from these deposits has produced records of many hay meadow plants (A.R. Hall, pers. comm.).

3. Discussion and conclusions

3.1 Marine resource exploitation

The close association of York with the sea, and the use of the Ouse-Humber basin as a fishing ground is by now well evidenced in the archaeological record from the city. What the finds from the General Accident site have added to this picture is some firm evidence for the Roman period. Evidently oysters were fished in quantity, although not to such an extent as to have a serious effect on their populations. Not until the medieval period is there a serious size decrease in the oysters being taken.

The frequency with which fragments of shell of edible crab were recovered from Roman samples is particularly interesting for two reasons. First, an examination of hundreds of soil samples of 9th to 13th century date from 16-22 Coppergate produced only a few specimens of crab shell, consistent with the post-Roman deposits at the General Accident site. Second, edible crab is a species of rocky shores, rather than the sand or mud of, for example, the Humber estuary, and requires either specially-designed baskets or great perseverance if it is to be fished in useful quantities. The presence of appreciable numbers of edible crabs in Roman York suggests either that fishing boats operating out of the city were making long journeys beyond Spurn Head to the rocky East coast, or that there was overland trade of crabs between York and communities on the coast. In either case, the market value of crabs must have been quite high.

Marine products in the form of crabs and oysters were evidently an important minor part of the food supply of the colonia. It would seem that other shellfish were not highly prized apart, perhaps, from mussels. Work in progress on fish bones from Roman deposits at this site shows little exploitation of marine fish (A.K.G. Jones, pers. comm.), a point which makes it less likely that edible crab was fished by boats operating from York, since such boats would surely have brought in sea fish as well in order to justify the long journey. The presence of inedible 'accidental' marine shells, such as *Nucella lapillus* and *Patina pellucida*, may confirm that shellfish catches were processed in the city, although these shells could have been imported on seaweed used to protect live crabs whilst in transit.

3.2 Environmental conditions around the site

Only Roman deposits produced enough land and freshwater molluscs to give even a hint as to environmental conditions. Apart from the River Ouse, some smaller and perhaps intermittent water bodies would appear to have been available, and the frequent records of *Succinea putris* would be consistent with areas of waterside vegetation and mud. Amongst the land snails, it is interesting to contrast the results from the General Accident site with those from Anglo-Scandinavian levels at 16-22 Coppergate, where analogous accumulations of organic occupation debris ought to have produced similar environmental conditions. Two species common at Coppergate, *Oxychilus alliarius* and *Clausilia bidentata*, were respectively scarce in and absent from General Accident samples. In the case of the latter species, it has been suggested elsewhere (O'Connor, in prep.) that this woodland snail was inadvertently imported into the city and adapted well to an environment of timber buildings surrounded by compost. Its absence from the General Accident site may only show that C. bidentata was never introduced into the city in the Roman period and so never had a chance to establish itself. O. alliarius was represented only by two specimens in one pre-Roman sample, and this scarcity is hard to explain, as this is an adaptable little snail which should have been well capable of exploiting habitats available in the Roman period. Unlike C. bidentata, its 'natural' distribution extends over a wide range of types of habitat, with moderate humidity being the only requirement. One is forced to conclude that O. alliarius was not abundant in and around York in the Roman period, otherwise it surely would have been common in samples from this site. In view of the widespread distribution of the species today, this is a somewhat surprising conclusion, which should be tested whenever further opportunity arises.

To sum up, the land snails suggest that appreciable stands of vegetation grew near the site, perhaps similar to the banks of umbellifers and other rank herbs which grow along riversides in the York area today. Had this part of the colonia been cleared of vegetation and built upon to any great extent, then it seems unlikely that Cepea snails would have been so frequent in soil samples. The margins of the river appear to have been shifting and muddy, probably with small ponds and marshy areas.

The results which have been presented in this report are not of great moment, but have contributed a few motes of information to the archaeological study of York, as well as raising some questions for further study as more material becomes available. In terms of man-hours, this was a small project and the results have more than justified the modest expenditure of resources.

4. Data tables

	Period	A	B	D	E	F	A/B	B/C	B-E
Taxon									
whelk	Buccinium undatum	–	2	1	–	–	–	–	
crab	Cancer pagurus	–	4	–	–	–	–	–	–
cockle	Cerastoderma edule	–	1	–	–	–	–	–	–
mussel	Mytilus edulis	–	17	1	–	–	–	–	1
whelk	Neptunea antiqua	–	1	–	–	–	–	–	–
oyster	Ostrea edulis	4	208	19	88	7	3	40	82
limpet	Patella vulgata	–	4	–	1	–	–	4	–

Table 4.1. Distribution of hand-collected marine shells by period

Length	<40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100+
Context														
1018	-	-	1	2	8	5	6	-	-	1	-	1	-	-
1040	-	1	1	15	30	32	27	10	4	1	-	-	-	-
1041	-	-	1	-	-	5	-	2	1	-	-	-	-	-
1184	-	1	-	-	6	12	12	6	1	-	-	-	-	-
1200	-	-	-	1	2	-	2	1	-	-	1	-	1	-
1307	-	-	-	-	2	1	5	2	1	1	1	-	-	-
1309	-	-	-	-	1	1	2	-	-	-	-	-	-	-
1376	-	-	-	-	-	-	2	1	-	1	-	-	-	-
1377	-	-	-	-	-	2	2	-	1	-	-	-	-	-
1392	1	-	-	-	-	-	4	2	6	3	3	-	1	-
1406	-	-	-	-	3	4	4	5	7	5	2	2	3	2
2260	-	-	-	-	-	2	2	6	2	2	2	1	1	-
2275	-	1	1	-	1	1	7	14	10	6	3	-	-	-
2361	-	-	-	-	6	4	9	7	7	6	5	2	2	1
2381	1	-	-	-	-	1	7	7	8	4	1	-	-	-
3360	-	-	-	-	-	3	-	9	11	5	2	1	3	-
3362	-	-	-	-	-	-	1	2	2	-	2	-	1	3
4145	-	-	1	-	-	1	5	5	3	2	1	1	-	-
4261	-	-	1	-	-	3	10	7	15	5	3	1	1	-
all E	-	1	3	17	38	42	33	12	5	2	-	1	-	-
all B/C	-	1	-	-	6	12	12	6	1	-	-	-	-	-
all B	2	1	3	1	15	20	61	47	60	35	22	7	9	3
all A	-	-	-	-	-	3	1	11	13	5	4	1	4	3

Table 4.2. Size classes of oyster left valves. Lengths are in millimetres rounded up, i.e. a shell of 60mm is grouped as 60-65, not 55-60.

Period	A	B	D	E	F	A/B	B/C	B-E
Taxon								
Anisus leucostoma (Mill.)	1	3	-	-	-	1	-	-
Aplexa hypnorum (L.)	-	1	-	-	-	-	-	-
Bithynia tentaculata (L.)	-	1	-	-	-	-	-	-
Buccinium undatum (L.)	-	4	-	-	-	-	-	-
Cancer pagurus L.	-	33	-	1	-	1	-	-
Carychium minimum Mull.	1	-	-	-	-	-	-	-
Cepea sp.	9	10	-	-	-	2	-	-
Cerastoderma edule L.	-	2	-	-	-	-	-	-
Candidula gigaxii (Pfeiff.)	-	1	-	-	-	-	-	-
Cochlicopa lubrica (Mull.)	2	1	-	-	-	-	-	-
Deroceras sp.	-	1	-	-	1	-	-	3
Discus rotundatus (Mull.)	2	4	-	-	-	1	-	-
eggshell	3	70	1	15	3	-	3	9
Helix aspersa Mull.	-	3	-	-	-	-	-	-
Littorina littorea (L.)	-	2	-	-	-	-	-	-
Lymnaea glabra (Mull.)	-	1	-	-	-	-	-	-
L. palustris (Mull.)	-	1	-	-	-	-	-	-
L. truncatula (Mull.)	1	1	-	-	-	-	-	-
Mytilus edulis L.	1	74	-	14	-	2	2	9
Neptunea antiqua (L.)	-	1	-	-	-	-	-	-
Nesovitrea hammonis (Strom)	-	2	-	-	-	-	-	-
Nassaridae sp.	-	1	-	-	-	-	-	-
Nucella lapillus (L.)	-	2	-	-	-	-	-	-
Ostrea edulis L.	2	98	1	22	3	3	2	14
Oxychilus alliarius (Mill.)	1	-	-	-	-	-	-	-
Patina pellucida (L.)	-	1	-	-	-	-	-	-
Patella vulgata L.	1	3	-	-	-	-	-	-
Pecten maximus (L.)	-	1	-	-	-	-	-	-
Planorbarius corneus (L.)	1	2	-	-	-	-	-	-
Planorbis planorbis (L.)	-	1	-	-	-	-	-	-
Succinea putris (L.)	2	9	-	-	-	1	-	-
Theodoxus fluviatilis (L.)	-	1	-	-	-	-	-	-
Trichia hispida (L.)	3	6	-	-	-	-	-	-
T. striolata (Pfeiff.)	1	1	-	-	-	-	-	-
Unio sp.	-	-	-	-	1	-	-	-
Unio tumidus Phil.	-	-	-	-	1	-	-	-
Valvata piscinalis (Mull.)	-	-	-	-	1	-	-	-
indet. whelk	-	1	-	-	-	-	-	-

Table 4.3. Frequency of shell taxa in soil samples. Note that these are not numbers of specimens, but number of samples in which the taxon was present. Specimens of *Cepea* sp. identifiable to species were all *Cepea hortensis* (Muller). *Trichia hispida* includes *T. plebeia* (Draparnaud).

	Area1		Area2		Area3	Area4
	f	%	f	%	f	f
crabshell	12	32	16	34	3	2
eggshell	18	49	38	81	6	8
mussel	33	89	28	60	6	7
oyster	37	100	47	100	6	8

Table 4.4. Frequency of major shell components in soil samples.
f = number of samples in which component occurred
% = percentage frequency, taking f-oyster to be 100

	sample 366	sample 374	sample 378	sample 522
Taxon				
Bithynia tentaculata	-	-	-	9
Carychium minimum	-	2	-	-
Aplexa hypnorum	-	-	-	2
Lymnaea glabra	-	-	-	6
L. palustris	-	-	-	2
Anisus leucostoma	1	-	-	39
Planorbarius corneus	-	-	1	20
Succinea putris	4	-	5	-
Cochlicopa lubrica	3	-	2	-
Discus rotundatus	-	1	-	-
Oxychilus alliarius	2	-	-	-
Trichia hispida	3	1	1	-
T. striolata	-	-	6	-
Cepea hortensis	1	-	17	-

Table 4.5. Abundance of mollusca in four samples.
Samples 366, 374 and 378 are from pre-Roman levels in Area 3.
Sample 522 is from a mid-2nd century man-made bank in Area 2.

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